

Chapter 5. EMERGENCY SERVICES

Section 1. GENERAL

5-1-1. EMERGENCY DETERMINATION

a. Because of the infinite variety of possible emergency situations, specific procedures cannot be prescribed. However, when you believe an emergency exists or is imminent, select and pursue a course of action which appears to be most appropriate under the circumstances, and which most nearly conforms to the instructions in this manual.

b. An emergency can be either a DISTRESS or URGENCY condition, as defined in the Pilot/Controller Glossary.

NOTE-

A pilot who encounters a DISTRESS condition may declare an emergency by beginning the initial communication with the word MAYDAY, preferably repeated three times. For an URGENCY condition, the word PAN-PAN may be used in the same manner.

c. If the words MAYDAY or PAN-PAN are not used, and you are in doubt that a situation constitutes an emergency or potential emergency, handle it as though it were an emergency.

d. Consider an aircraft emergency exists and inform the appropriate control facility and the DF net control (See FAO 7210.3, para 6-3-3, DF Net Control Position Operation), if not the same, when:

1. An emergency is declared by any of the following:

(a) The pilot.

(b) Facility personnel.

(c) Officials responsible for the operation of the aircraft.

2. Reports indicate that the aircraft's operating efficiency is so impaired that a forced landing may be/is necessary.

3. Reports indicate the crew has abandoned the aircraft or is about to do so.

4. Intercept or escort services are requested.

5. The need for ground rescue appears likely.

6. An Emergency Locator Transmitter (ELT) signal is heard or reported.

REFERENCE-

Subpara 5-1-2c and Para 5-2-8.

5-1-2. RESPONSIBILITY

a. If you are in communication with an aircraft in distress, handle the emergency and coordinate and direct the activities of assisting facilities. Transfer this responsibility to another facility only when you feel better handling of the emergency will result.

b. When you receive information about an aircraft in distress, forward detailed data to the appropriate control facility in whose area the emergency exists.

NOTE-

Notifying the appropriate control facility about a VFR aircraft emergency allows provision of IFR separation if considered necessary.

c. The ARTCC is responsible for consolidation of all pertinent ELT signal information. Notify the ARTCC of all heard or reported ELT signals.

5-1-3. OBTAINING INFORMATION

Obtain enough information to handle the emergency intelligently. Base your decision as to what type of assistance is needed on information and requests received from the pilot. 14 CFR Part 91 authorizes the pilot to determine a course of action.

5-1-4. COORDINATION

a. Request necessary assistance from other facilities as soon as possible, particularly if radar or DF service is available.

b. Coordinate efforts to the extent possible to assist any aircraft believed overdue, lost, or in emergency status.

5-1-5. PROVIDING ASSISTANCE

a. Provide maximum assistance to aircraft in distress. If the aircraft is transponder equipped and not on an IFR flight plan, request the pilot to squawk code 7700.

PHRASEOLOGY-

REQUEST YOU SQUAWK SEVEN SEVEN ZERO ZERO.

b. Enlist the service of available radar and DF facilities.

5-1-6. RECORDING INFORMATION

Record all actions taken in the provision of emergency assistance.

5-1-7. SAFE ALTITUDES FOR ORIENTATIONS

a. Providing a safe altitude, during an orientation, is advisory in nature.

b. Safe altitude computations, once the aircraft position is known, are as follows:

1. Locate the maximum elevation figure on the appropriate VFR sectional chart.

2. To the maximum elevation figure,

(a) add 1,000 feet over nonmountainous terrain, or

(b) add 2,000 feet over mountainous terrain.

3. The mountainous/nonmountainous areas are found in Title 14 CFR, Part 95.

Section 2. OPERATIONS

5-2-1. INFORMATION REQUIREMENTS

a. Start assistance as soon as enough information has been obtained upon which to act. Information requirements will vary, depending on the existing situation. Minimum required information for inflight emergencies is:

1. Aircraft identification, type, and transponder.
2. Nature of the emergency.
3. Pilot's desires.

b. After initiating action, provide the altimeter setting and obtain the following items or any other pertinent information from the pilot or aircraft operator as necessary:

1. Aircraft altitude.
2. Fuel remaining in time.
3. Pilot reported weather.
4. Pilot capability for IFR flight.
5. Time and place of last known position.
6. Heading since last known position.
7. Airspeed.
8. Navigation equipment capability.
9. NAVAID signals received.
10. Visible landmarks.
11. Aircraft color.
12. Number of people on board.
13. Point of departure and destination.
14. Emergency equipment on board.

5-2-2. FREQUENCY CHANGES

Provide assistance on the initial contact frequency. Change frequencies only when there is a valid reason.

5-2-3. AIRCRAFT ORIENTATION

Orient an aircraft by the means most appropriate to the circumstances. Recognized methods include:

- a. Radar.
- b. DF.
- c. NAVAID's.

d. Pilotage.

e. Sighting by other aircraft.

5-2-4. ALTITUDE CHANGE FOR IMPROVED RECEPTION

If deemed necessary, and if weather and circumstances permit, recommend the aircraft maintain or increase altitude to improve communications, radar, or DF reception.

5-2-5. ALERTING CONTROL FACILITY

When an aircraft is considered to be in emergency status, alert the appropriate control facility and forward the following information as available:

- a. Facility and person calling.
- b. Flight plan, including color of aircraft if known.
- c. Time of last transmission received, by whom, and frequency used.
- d. Last known position, estimated present position, and maximum range of flight of the aircraft based on remaining fuel and airspeed.
- e. Action taken by reporting facility and proposed action.
- f. Number of persons on board.
- g. Fuel status.
- h. Position of other aircraft near the aircraft's route of flight when requested.
- i. Whether an ELT signal has been heard or reported in the vicinity of the last known position.
- j. Other pertinent information.

5-2-6. VFR AIRCRAFT IN WEATHER DIFFICULTY

If a VFR aircraft requests assistance when it encounters or is about to encounter IFR weather conditions, request the pilot contact the appropriate control facility. Inform that facility of the situation. If the pilot is unable to communicate with the control facility, relay information and clearances.

5-2-7. AIRCRAFT POSITION PLOTS

Plot the flight path of the aircraft on a chart, including position reports, predicted positions, possible range of flight, and any other pertinent information. Solicit the

assistance of other aircraft known to be operating near the aircraft in distress. Forward the information to the appropriate control facility.

5-2-8. EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS

When an ELT signal is heard or reported:

a. Notify the ARTCC, who will coordinate with the Rescue Coordination Center (RCC).

b. If the ELT signal report was received from an airborne aircraft, attempt to obtain the following information:

1. The aircraft altitude.
2. Where and when the signal was first heard.
3. Where and when maximum signal was heard.
4. Where and when signal faded or was lost.

Solicit the assistance of other aircraft known to be operating in the signal area for the same information. Relay all information obtained to the ARTCC.

c. Attempt to obtain fixes or bearings on the signal and forward any information obtained to the ARTCC.

NOTE-

Fix information, in relation to a VOR or a VORTAC (radial distance), facilitates accurate ELT plotting by RCC and should be provided when possible.

d. In addition to the above, when the ELT signal strength indicates the transmitter may be on the airport or in the vicinity, notify the on-site Airway Facilities personnel for their action.

e. Air Traffic personnel shall not leave their required duty stations to locate an ELT signal source.

f. Attempt to locate the signal source by checking all adjacent airports not already checked by other ATC facilities for the following information:

1. Can ELT signal be heard.
2. Does signal strength indicate transmitter may be on airport.
3. Can attempt be made to locate and silence transmitter.
4. Advise the results of any action taken. Forward all information obtained and action taken to the ARTCC.

g. Notify the ARTCC if the signal source is located and whether the aircraft is in distress, plus any action

taken or proposed for silencing the transmitter. Request person who located signal's source to attempt to obtain ELT make, model, etc., for relay to RCC via the ARTCC.

h. Notify the ARTCC if the signal terminates prior to location of the source.

NOTE-

1. The ARTCC serves as the contact point for collecting information and coordinating with the RCC on all ELT signals.

2. Operational ground testing of ELT has been authorized during the first 5 minutes of each hour. To avoid confusing the tests with an actual alarm, the testing is restricted to no more than three audio sweeps.

3. Portable hand-carried receivers assigned to Air Traffic facilities (where no Airway Facilities personnel are available) may be loaned to responsible airport personnel or local authorities to assist in locating signal source.

5-2-9. EXPLOSIVE CARGO

When you receive information that an emergency landing will be made with explosive cargo aboard, inform the pilot of the safest or least congested airport areas. Relay the explosive cargo information to:

- a. The emergency equipment crew.
- b. The airport management.
- c. The appropriate military agencies when requested by the pilot.

5-2-10. EXPLOSIVE DETECTION DOG HANDLER TEAMS

Take the following actions upon receipt of a pilot request for the location of the nearest explosive detection K-9 team.

- a. Obtain the aircraft's identification and current position and advise the person in charge of the watch of the pilot's request.
- b. Relay the pilot's request to the FAA Washington Operations Center, ADA-30, (202) 267-3333, and provide the aircraft identification and position.
- c. ADA-30 will provide the nearest location. Have ADA-30 standby while the information is relayed to the pilot.
- d. If the pilot wishes to divert to the airport location provided, obtain an estimated arrival time from the pilot and advise the person in charge of the watch.

e. After the aircraft destination has been determined, estimate the arrival time and advise ADA-30. ADA-30 will then notify the appropriate airport authority at the diversion airport. In the event the K-9 team is not available at this airport, ADA-30 will advise the AT facility and provide them with the secondary location. Relay this to the pilot concerned for appropriate action.

REFERENCE-

FAAO 7210.3, Para 2-1-10, Explosives Detection K-9 Teams.

5-2-11. INFLIGHT EQUIPMENT MALFUNCTIONS

When a pilot reports an inflight equipment malfunction, take the following action:

a. Request the nature and extent of any special handling desired.

NOTE-

14 CFR Part 91 requires the pilot in command of each aircraft operated in controlled airspace under IFR shall report as soon as practical to ATC any malfunctions of navigational, approach, or communication equipment occurring in flight. This includes the degree to which the capability of the aircraft to operate IFR in the air traffic control system is impaired and the nature and extent of any assistance desired from air traffic control.

b. Provide the maximum assistance possible consistent with equipment, workload, and any special handling requested.

c. Relay any special handling required or being provided to other specialists or facilities who will subsequently handle the aircraft.

5-2-12. NAVY FLEET SUPPORT MISSIONS

Handle Navy Fleet Support Missions aircraft as follows:

a. When you receive information concerning an emergency to a U.S. Navy Special Flight Number aircraft, inform the nearest ARTCC of all pertinent information.

b. Relay the words SPECIAL FLIGHT NUMBER followed by the number given as part of the routine IFR flight information.

5-2-13. COUNTRIES IN THE SPECIAL INTEREST FLIGHT PROGRAM

Upon receipt of any flight movement data on an aircraft registered in a communist-controlled country, notify the supervisor and the appropriate ARTCC

immediately. Additionally, if the aircraft is making an emergency or an unscheduled landing in the United States, notify the nearest U.S. Customs Service Office.

NOTE-

Communist-controlled countries include Albania, Bulgaria, Cambodia, Peoples Republic of China, Cuba, North Korea, Outer Mongolia, Romania, Former USSR countries recognized as the Russian Federation Commonwealth of Independent States, and Socialist Republic of Vietnam.

5-2-14. MINIMUM FUEL

If an aircraft declares a state of "minimum fuel," inform any facility to whom control jurisdiction is transferred of the minimum fuel problem and be alert for any occurrence which might delay the aircraft en route.

NOTE-

Use of the term minimum fuel indicates recognition by a pilot that the fuel supply has reached a state whereupon reaching destination, any undue delay cannot be accepted. This is not an emergency situation, but merely an advisory that indicates an emergency situation is possible should any undue delay occur. A minimum fuel advisory does not imply a need for traffic priority. Common sense and good judgment will determine the extent of assistance to be given in minimum fuel situations. If, at any time, the remaining usable fuel supply suggests the need for traffic priority to ensure a safe landing, the pilot should declare an emergency and report fuel remaining in minutes.

5-2-15. AIRCRAFT BOMB THREATS

a. When information is received from any source that a bomb has been placed on, in, or near an aircraft for the purpose of damaging or destroying such aircraft, notify the supervisor or facility manager. If the threat is general in nature, handle it as a suspicious activity. When the threat is targeted against a specific aircraft and you are in contact with that aircraft, take the following actions as appropriate:

NOTE-

1. Facility supervisors are expected to notify the appropriate offices, agencies, and operators/air carriers according to applicable plans, directives, FAAO 7210.3, Facility Operation and Administration, or military directives.

2. Suspicious activity is covered in FAAO 7210.3, Facility Operation and Administration. Military facilities would report a general threat through the chain of command or according to service directives.

3. A specific threat may be directed at an aircraft registry

or tail number, the air carrier flight number, the name of an operator, crew member or passenger, the departure/arrival point or times, or combinations thereof.

1. Advise the pilot of the threat.

2. Inform the pilot that technical assistance can be obtained from an FAA aviation explosives expert.

NOTE-

An FAA aviation explosives expert is on call at all times and may be contacted by calling the FAA Operations Center, Washington, DC, (202) 267-3333. Technical advice can be relayed to assist civil or military air crews in their search for a bomb and in determining what precautionary action to take if one is found.

3. Ask if the pilot desires to climb or descend to an altitude that would equalize or reduce the outside air pressure/existing cabin air pressure differential. Obtain and relay an appropriate clearance considering MEA, MOCA, MRA, and weather.

NOTE-

Equalizing existing cabin air pressure with outside air pressure is a key step which the pilot may wish to take to minimize the damage potential of a bomb.

4. Handle the aircraft as an emergency, and/or provide the most expeditious handling possible with respect to the safety of other aircraft, ground facilities, and personnel.

NOTE-

Emergency handling is discretionary and should be based on the situation. With certain types of threats, plans may call for a low-key action or response.

5. Obtain and relay clearance to a new destination, if requested.

6. When a pilot requests technical assistance or if it is apparent that such assistance is needed, do NOT suggest what actions the pilot should take concerning a bomb, but obtain the following information and notify the supervisor who will contact the FAA aviation explosives expert:

NOTE-

This information is needed by the FAA aviation explosives expert so that the situation can be assessed and immediate recommendations made to the pilot. The aviation explosives expert may not be familiar with all military aircraft configurations but can offer technical assistance which would be beneficial to the pilot.

(a) Type, series, and model of the aircraft.

(b) Precise location/description of the bomb device if known.

(c) Other details which may be pertinent.

NOTE-

The following details may be of significance if known, but it is not intended that the pilot should disturb a suspected bomb/bomb container to ascertain the information:

1. The altitude or time set for the bomb to explode.

2. Type of detonating action (barometric, time, anti-handling, remote radio transmitter).

3. Power source (battery, electrical, mechanical).

4. Type of initiator (blasting cap, flash bulb, chemical).

5. Type of explosive/incendiary charge (dynamite, black powder, chemical).

b. When a bomb threat involves an aircraft on the ground and you are in contact with the suspect aircraft, take the following actions in addition to those discussed in the preceding paragraphs which may be appropriate:

1. If the aircraft is at an airport where tower control or LAA is not available, or if the pilot ignores the threat at any airport, recommend that takeoff be delayed until the pilot or aircraft operator establishes that a bomb is not aboard in accordance with 14 CFR Part 121. If the pilot insists on taking off, and in your opinion the operation will not adversely affect other traffic, issue or relay an ATC clearance.

REFERENCE-

14 CFR Part 121.537.

2. Advise the aircraft to remain as far away from other aircraft and facilities as possible, to clear the runway, if appropriate, and to taxi to an isolated or designated search area. When it is impractical or if the pilot takes an alternative action, such as parking and offloading immediately, advise other aircraft to remain clear of the suspect aircraft by at least 100 yards, if able.

NOTE-

Passenger deplaning may be of paramount importance and must be considered before the aircraft is parked or moved away from the service areas. The decision to use ramp facilities rests with the pilot, aircraft operator, and/or airport manager.

c. If you are unable to inform the suspect aircraft of a bomb threat or if you lose contact with the aircraft, advise your supervisor and relay pertinent details to other sectors or facilities as deemed necessary.

d. When a pilot reports the discovery of a bomb or suspected bomb on an aircraft which is airborne or on the ground, determine the pilot's intentions and comply

with his/her requests insofar as possible. Take all the actions discussed in the preceding paragraphs which may be appropriate under the existing circumstances.

e. The handling of aircraft when a hijacker has or is suspected of having a bomb requires special considerations. Be responsive to the pilot's requests and notify supervisory personnel. Apply hijacking procedures and, if needed, offer assistance to the pilot according to the preceding paragraphs.

5-2-16. SECURITY CONTROL OF AIR TRAFFIC AND NAVIGATION AIDS (SCATANA)

a. The SCATANA Plan outlines responsibilities, procedures, and instructions for the security control of civil and military air traffic and NAVAID's under various emergency conditions.

b. When notified of SCATANA implementation, follow the instructions of FAA Form 7610-1 and any additional instructions received from the ARTCC.

1. To ensure that SCATANA actions can be taken expeditiously, periodic SCATANA tests will be conducted in connection with NORAD exercises. Tests may be local, regional, or national in scope.

2. AFSS/FSS facilities will participate in tests except where such participation will involve the safety of aircraft.

3. During SCATANA tests, all actions will be simulated.

REFERENCE-
FAAO 7610.4, Special Military Operations.

Section 3. DIRECTION FINDER (DF) SERVICE

5-3-1. ACTIONS REQUIRED

When providing DF services to an aircraft in emergency status:

- a. Determine if the aircraft is in VFR or IFR weather conditions, fuel remaining, altitude, and heading.
- b. If the aircraft is operating in IFR weather conditions, coordinate with the appropriate control facility.
- c. Determine if the aircraft is on a flight plan. If the aircraft is not on an IFR flight plan and is in VFR weather conditions, advise the pilot to remain VFR.
- d. Alert the DF net whenever the following conditions exist:

1. The pilot is lost.
2. An emergency is declared.

NOTE-

It is not necessary to alert the DF net if a terminal controller visually sights the aircraft.

5-3-2. VFR DF SERVICE

- a. Provide DF service to VFR aircraft when either of the following conditions exist:

1. The pilot requests the service.
2. You suggest the service and the pilot concurs.

- b. Advise the pilot to remain VFR, and provide local altimeter setting.

PHRASEOLOGY-

MAINTAIN V-F-R AT ALL TIMES. ADVISE IF HEADING OR ALTITUDE CHANGE IS NECESSARY TO REMAIN V-F-R. (location) ALTIMETER (setting).

- c. Obtain heading and altitude. Advise the pilot to maintain straight and level flight and to align the heading indicator with the magnetic compass.

PHRASEOLOGY-

MAINTAIN STRAIGHT AND LEVEL FLIGHT. RESET YOUR HEADING INDICATOR TO AGREE WITH YOUR MAGNETIC COMPASS. AFTER YOU HAVE DONE THIS, SAY YOUR HEADING AND ALTITUDE.

- d. Determine the weather and fuel conditions.

PHRASEOLOGY-

WHAT IS THE WEATHER AT YOUR ALTITUDE AND FUEL REMAINING IN TIME?

- e. Advise the pilot to maintain the same heading, request type of navigational equipment, and airspeed.

PHRASEOLOGY-

CONTINUE HEADING (degrees). WHAT TYPE OF NAVIGATIONAL EQUIPMENT DO YOU HAVE ON BOARD AND WHAT IS YOUR AIRSPEED?

- f. While receiving the reply, determine the bearing. After determining the aircraft's bearing, provide DF service by informing the pilot of the following:

1. Direction of turn.
2. Magnetic heading, spoken in three digits (do not state the word "degrees"). All headings will be provided in increments of 5 degrees.
3. Nature of service.
4. Microphone instructions.
5. Request for report when airport is in sight.

PHRASEOLOGY-

TURN LEFT/RIGHT HEADING (degrees) FOR D-F GUIDANCE TO (name of airport, fix, or location). WHEN A REQUEST FOR TRANSMISSION IS RECEIVED, PRESS YOUR MICROPHONE BUTTON FOR THE SPECIFIED NUMBER OF SECONDS FOLLOWED BY YOUR AIRCRAFT IDENTIFICATION.

and if appropriate,

REPORT (name) AIRPORT IN SIGHT.

- g. Provide pertinent information on known field conditions and latest weather information at the destination airport.

- h. Request the pilot to transmit for specified periods (normally 5-10 seconds), as required. The frequency of these requests will vary depending on such factors as wind, frequency congestion, and distance, but should be made at least once each minute until the pilot reports the airport in sight or the service is terminated.

PHRASEOLOGY-

TRANSMIT (number) SECONDS.

TURN LEFT/RIGHT, HEADING (degrees), or CONTINUE HEADING (degrees).

- i. Inform the pilot when DF service is terminated and provide the (CTAF) frequency, if appropriate, and the local altimeter setting.

PHRASEOLOGY-

D-F ORIENTATION SERVICE TERMINATED. COMMON TRAFFIC ADVISORY FREQUENCY (frequency) ALTIMETER (setting).

NOTE-

Service may be terminated when airport is in sight, the desired fix or location is reached, practice steers or approaches are discontinued, etc.

- j. Notify DF net when service is terminated.

5-3-3. DF FIXING BY NET

When the DF net is in operation, determine the aircraft's position as follows:

- a. Tell the pilot to transmit for 10 seconds.
- b. Plot the bearings obtained from two or more antenna sites. Inform the pilot of the aircraft's position, and the safe altitude for orientation in that area.

NOTE-

The ARTCC or AFSS/FSS designated as DF net control is responsible for evaluating and plotting bearings received from individual antenna sites.

5-3-4. DF FIXING BY ONE FACILITY

One DF facility can determine an aircraft's location by:

- a. Plotting the position from a VOR or ADF and an observed DF bearing.
- b. Time method.

1. Determine the aircraft's heading and DF bearing.

2. Tell the pilot to turn left or right, whichever requires the lesser amount of turn, to a heading perpendicular to the DF bearing.

3. After turn is completed, tell the pilot to transmit (normally 5-10 seconds). Observe the DF bearing.

4. One minute later, request another transmission. Determine bearing and turn aircraft toward the DF site.

5. Divide the difference in bearings (steps 3 and 4) into 60. The result is the number of minutes the aircraft is from the DF site.

NOTE-

One station DF fixing is based on zero winds.

EXAMPLE-

Original bearing of 360 and aircraft heading of 200, the pilot should be advised to turn right to a heading of 270. Observe bearing, wait 1 minute, and observe bearing. If the first bearing (after completion of turn) was 337 and the second bearing was 325, a difference of 12, the aircraft is 5 minutes from the DF site.

- c. Distance method.

1. Use the procedures specified in steps 1 through 4 in subpara 5-3-4b.

2. Request the aircraft's true airspeed.

3. Compute the distance by dividing the bearing change (for 1 minute) into the airspeed figure.

EXAMPLE-

140 airspeed divided by 10 (bearing change for 1 minute) = 14 miles from DF site.

- d. After the aircraft's position is determined, provide this information, and the safe altitude for orientation in that area.

5-3-5. EMERGENCY DF APPROACH PROCEDURE

- a. Under emergency conditions where a standard instrument approach cannot be executed, provide DF guidance and instrument approach service, if available, as follows:

1. Obtain and relay ATC clearance including radio failure procedures.

2. Issue destination airport weather.

3. Provide guidance as specified in VFR DF Service, para 5-3-2, except delete the VFR requirement. To avoid large turns over the DF site, the aircraft should be guided to pass over the DF site established on the course that the pilot will maintain on the outbound leg of the approach.

PHRASEOLOGY-

TURN LEFT/RIGHT, HEADING (degrees) FOR D-F GUIDANCE AND APPROACH TO THE (name) AIRPORT. MAINTAIN (altitude specified by ATC). WHEN A REQUEST FOR TRANSMISSION IS RECEIVED, PRESS YOUR MICROPHONE BUTTON FOR THE SPECIFIED NUMBER OF SECONDS FOLLOWED BY YOUR AIRCRAFT IDENTIFICATION. REPORT AIRPORT IN SIGHT. IF NO TRANSMISSION IS RECEIVED FOR (time of interval) PROCEED V-F-R. IF UNABLE, PROCEED (routing, fix, altitude as specified by ATC). CONTACT (facility) ON (frequency).

- b. Inform the pilot when the aircraft is over the DF site. Advise pilot to perform landing check, and provide guidance for outbound track.

PHRASEOLOGY-

OVER (ABEAM) D-F SITE, PERFORM LANDING CHECK. CONTINUE HEADING (degrees) or TURN LEFT/RIGHT, HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

- c. Provide DF approach guidance in accordance with the triangle or teardrop approach procedures as specified on FAA Form 8260-10.

1. Triangle Approach Pattern.

(a) Time the outbound leg and issue descent information. Normally, the outbound track should be maintained for 3 minutes, but this may be adjusted depending on airspeed and nature of the emergency. Time intervals between bearing observations should not exceed 15 seconds.

PHRASEOLOGY-

ON OUTBOUND LEG. DESCEND AND MAINTAIN (altitude specified on FAA Form 8260-10 for outbound course).

(b) When outbound leg is completed, issue turn instructions so that the aircraft's course is perpendicular to the final approach course. Issue further descent information if so specified on FAA Form 8260-10. Issue missed approach procedures as specified on FAA Form 8260-10.

PHRASEOLOGY-

ON BASE LEG. IN CASE OF MISSED APPROACH, CLIMB TO (altitude) ON COURSE (degrees) WITHIN (number) MILES.

(c) At least two turns should be made onto final approach.

(d) When the aircraft is on final approach, advise the pilot to start descent and provide minimum descent altitude and field elevation information. Take

bearings more frequently. Time intervals between bearing observations should not exceed 5 seconds during the estimated last 30 seconds of the approach.

PHRASEOLOGY-

ON FINAL APPROACH, BEGIN DESCENT. MINIMUM DESCENT ALTITUDE (altitude), FIELD ELEVATION (elevation). REPORT RUNWAY IN SIGHT.

(e) If the aircraft misses the approach, inform the appropriate control facility.

2. Teardrop Approach Pattern.

(a) Provide guidance to establish the aircraft on the outbound course. Issue descent information, if appropriate. Time intervals between bearing observations should not exceed 15 seconds.

(b) Issue direction of turn and inbound heading information. Issue missed approach procedures as specified on FAA Form 8260-10.

(c) When procedure turn is complete, provide directional guidance and issue descent information. The time intervals between the bearing observations should not exceed 5 seconds during the estimated last 30 seconds of the approach.

(d) If aircraft misses the approach, inform the appropriate control facility.

Section 4. ADF/VOR ORIENTATION

5-4-1. ACTIONS REQUIRED

When providing ADF/VOR orientation services to an aircraft in emergency status:

- Determine if the aircraft is in VFR or IFR weather conditions, fuel remaining, altitude, and heading.
- If the aircraft is operating in IFR weather conditions, coordinate with the appropriate control facility.
- Determine if the aircraft is on a flight plan. If the aircraft is not on an IFR flight plan and is in VFR weather conditions, advise the pilot to remain VFR.

5-4-2. ADF ORIENTATION/ADF CROSSFIX

When using ADF orientation and/or crossfix procedures, determine the aircraft's position as follows:

a. Position Fixing.

- Advise the pilot to remain VFR, and provide local altimeter setting.

PHRASEOLOGY-

MAINTAIN V-F-R AT ALL TIMES. ADVISE IF HEADING OR ALTITUDE CHANGE IS NECESSARY TO REMAIN V-F-R. (Location) ALTIMETER (setting).

- Obtain heading and altitude. Advise the pilot to maintain straight and level flight and to align the heading indicator with the magnetic compass.

PHRASEOLOGY-

MAINTAIN STRAIGHT AND LEVEL FLIGHT. RESET YOUR HEADING INDICATOR TO AGREE WITH YOUR MAGNETIC COMPASS. AFTER YOU HAVE DONE THIS, SAY YOUR HEADING AND ALTITUDE.

- Determine the weather and the fuel conditions.

PHRASEOLOGY-

WHAT IS THE WEATHER AT YOUR ALTITUDE AND FUEL REMAINING IN TIME?

- Advise the pilot to maintain the same heading, verify the aircraft has ADF equipment, and determine the airspeed.

PHRASEOLOGY-

CONTINUE HEADING (degrees). WHAT TYPE OF NAVIGATIONAL EQUIPMENT DO YOU HAVE ON BOARD, AND WHAT IS YOUR AIRSPEED?

- Advise the pilot to tune the ADF receiver to the NDB. Provide the NDB name, identifier, and frequency.

PHRASEOLOGY-

TUNE YOUR A-D-F RECEIVER TO THE (name) RADIO BEACON, FREQUENCY (frequency), IDENTIFICATION (ident). CHECK VOLUME UP AND IDENTIFY THE STATION. ADVISE WHEN YOU HAVE DONE THIS.

- After acknowledgment has been received, advise the pilot to set the ADF function switch to the ADF position and report the reading.

PHRASEOLOGY-

IF YOU HAVE A ROTATING COMPASS CARD (ROSE) ON YOUR A-D-F INDICATOR, MAKE CERTAIN NORTH IS AT THE TOP OF THE DIAL. TURN THE FUNCTION SWITCH TO THE A-D-F POSITION. WHEN THE NEEDLE STABILIZES, ADVISE THE A-D-F NEEDLE READING.

REFERENCE-

The Instrument Flying Handbook. North may mean "north, N, zero (0) or 360."

- Compute the magnetic bearing.

NOTE-

Relative Bearing (RB) + Magnetic Heading (MH) = Magnetic Bearing (MB)

If the MB exceeds 360 degrees, subtract 360 to determine MB; i.e., 480 degrees - 360 degrees = 120 degrees MB.

- Advise the pilot of direction from the NDB.

PHRASEOLOGY-

YOU ARE (direction) OF THE (name) RADIO BEACON.

b. Orientation.

- Turn the aircraft inbound to the NDB being used. Provide the direction of the turn and the heading to be flown. Advise the pilot to report when established on that heading.

PHRASEOLOGY-

FOR A-D-F ORIENTATION, TURN LEFT/RIGHT HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

- Notify the appropriate control facility. Provide all required information including the aircraft's position and heading.

- Verify that the aircraft is established on a line of position to the NDB.

PHRASEOLOGY-

WHAT IS YOUR A-D-F NEEDLE READING?

- Provide heading adjustments as needed for the aircraft to continue inbound to the NDB.

(a) If the pilot indicates an ADF reading other than 3-6-0, compute the new heading and advise the aircraft.

PHRASEOLOGY-

TURN LEFT/RIGHT HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

(b) After pilot reports established and needle is on 3-6-0, heading adjustments are not necessary.

PHRASEOLOGY-

CONTINUE HEADING (degrees).

c. Crossfixing. After the aircraft is established inbound to the NDB, use the following procedures:

1. Advise the pilot to tune the ADF receiver to the NDB to be used for crossfixing. Provide the NDB name, identifier, and frequency.

PHRASEOLOGY-

TUNE YOUR A-D-F RECEIVER TO THE (name) RADIO BEACON, FREQUENCY (frequency), IDENTIFICATION (identification). CHECK VOLUME UP AND IDENTIFY THE STATION. ADVISE WHEN YOU HAVE DONE THIS.

2. After acknowledgment has been received, request ADF reading.

PHRASEOLOGY-

WHEN THE NEEDLE STABILIZES, ADVISE THE A-D-F NEEDLE READING.

3. Compute and plot the second line of position.

NOTE-

The intersection of the two lines of position is the aircraft's position at the time of the second ADF reading.

4. Advise the pilot of the aircraft's position and the safe altitude for orientation in that area.

PHRASEOLOGY-

YOU ARE (miles)(direction) OF THE (name) RADIO BEACON. THE SAFE ALTITUDE FOR ORIENTATIONS IN THAT AREA IS (feet).

5. Request pilot's intentions and provide assistance, as requested.

PHRASEOLOGY-

WHAT ARE YOUR INTENTIONS?

5-4-3. VOR ORIENTATION/VOR CROSSFIX

When using VOR orientation and/or crossfix procedures, determine the aircraft's position as follows:

a. Position Fixing.

1. Advise the pilot to remain VFR and provide the local altimeter setting.

PHRASEOLOGY-

MAINTAIN V-F-R AT ALL TIMES. ADVISE IF HEADING OR ALTITUDE CHANGE IS NECESSARY TO REMAIN V-F-R. (Location) ALTIMETER (setting).

2. Obtain heading and altitude. Advise the pilot to maintain straight and level flight and to align the heading indicator to agree with the magnetic compass.

PHRASEOLOGY-

MAINTAIN STRAIGHT AND LEVEL FLIGHT. RESET YOUR HEADING INDICATOR TO AGREE WITH YOUR MAGNETIC COMPASS. AFTER YOU HAVE DONE THIS, SAY YOUR HEADING AND ALTITUDE.

3. Determine the weather conditions and the fuel status.

PHRASEOLOGY-

WHAT IS THE WEATHER AT YOUR ALTITUDE AND FUEL REMAINING IN TIME.

4. Advise the pilot to maintain the same heading, verify the aircraft has VOR equipment, and determine the airspeed.

PHRASEOLOGY-

CONTINUE HEADING (degrees). WHAT TYPE OF NAVIGATIONAL EQUIPMENT DO YOU HAVE ON BOARD, AND WHAT IS YOUR AIRSPEED?

5. If the pilot calls on a simplex frequency, such as 122.2, advise the pilot to tune the receiver to the VOR you have selected. Provide the VOR name, frequency, and communication procedures.

PHRASEOLOGY-

CONTINUE TRANSMITTING THIS FREQUENCY. TUNE YOUR V-O-R RECEIVER TO THE (name) V-O-R, FREQUENCY (frequency) IDENTIFICATION (identification). CHECK VOLUME UP AND IDENTIFY THE STATION. ADVISE WHEN YOU HAVE DONE THIS.

NOTE-

If the pilot calls on duplex (122.1), use the VOR the pilot is tuned as the initial VOR.

6. Determine the aircraft's course selector reading.

PHRASEOLOGY-

ROTATE YOUR COURSE SELECTOR SLOWLY UNTIL THE LEFT/RIGHT NEEDLE CENTERS WITH A "TO" INDICATION. ADVISE YOUR COURSE SELECTOR READING.

7. Advise the pilot of the aircraft's position.

PHRASEOLOGY-

YOU ARE (direction) OF THE (name) V-O-R.

b. Orientation.

1. Turn the aircraft inbound to the VOR being used. Provide the direction of turn and the heading to be

flown. Advise the pilot to report when established on that heading.

PHRASEOLOGY-

FOR V-O-R ORIENTATION, TURN LEFT/RIGHT HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

2. Notify the appropriate control facility. Provide all the required information including the aircraft's position and heading.

3. Verify that the aircraft is established on a line of position to the VOR.

PHRASEOLOGY-

WHAT IS THE POSITION OF YOUR LEFT/RIGHT NEEDLE?

4. Provide heading adjustments as needed for the aircraft to continue inbound to the VOR.

(a) When the pilot indicates the left/right needle is not centered, advise the pilot to recenter needle with a "TO" indication and report the course selector reading.

PHRASEOLOGY-

Pilot response indicates needle not centered.

ROTATE YOUR COURSE SELECTOR SLOWLY UNTIL THE LEFT/RIGHT NEEDLE CENTERS WITH A "TO" INDICATION. ADVISE YOUR COURSE SELECTOR READING. (If appropriate) TURN LEFT/RIGHT HEADING (degrees). REPORT ESTABLISHED (degrees).

(b) After the aircraft is established on the inbound radial, advise the aircraft to continue on the inbound heading.

PHRASEOLOGY-

CONTINUE HEADING (degrees).

5. Plot line of position.

c. Crossfixing. After the aircraft is established inbound to the VOR, use the following procedures:

1. Advise the pilot to tune the receiver to the VOR you have selected for crossfixing. Provide VOR name, frequency, and lost communications procedures.

PHRASEOLOGY-

CONTINUE TRANSMITTING THIS FREQUENCY. TUNE YOUR V-O-R RECEIVER TO THE (name) V-O-R, FREQUENCY (frequency), IDENTIFICATION (identification). CHECK VOLUME UP. IF COMMUNICATION IS NOT ESTABLISHED IMMEDIATELY, RETURN TO THIS FREQUENCY.

2. Using only the voice feature of the second VOR, establish positive communication with the aircraft.

PHRASEOLOGY-

(Name) RADIO TRANSMITTING ON THE (name) V-O-R. HOW DO YOU HEAR? OVER.

NOTE-

Transmit only on the frequency of the VOR being used for crossfixing, if available.

3. After communication has been reestablished, advise the pilot to recenter the VOR left/right needle and advise the reading.

PHRASEOLOGY-

ROTATE YOUR COURSE SELECTOR SLOWLY UNTIL THE LEFT/RIGHT NEEDLE CENTERS WITH A "TO" INDICATION. ADVISE YOUR COURSE SELECTOR READING.

4. If the pilot is transmitting on duplex (122.1) and the cross fix VOR has no voice capability provide the following instructions.

PHRASEOLOGY-

CONTINUE TRANSMITTING THIS FREQUENCY. TUNE YOUR VOR RECEIVER TO THE (name) VOR, FREQUENCY (frequency), IDENTIFICATION (ident). CHECK VOLUME UP AND IDENTIFY THE STATION. ROTATE YOUR COURSE SELECTOR SLOWLY UNTIL THE LEFT/RIGHT NEEDLE CENTERS WITH A "TO" INDICATION. ADVISE YOUR COURSE SELECTOR READING (PAUSE).

RETUNE YOUR VOR RECEIVER TO THE (name) VOR, FREQUENCY (frequency), IDENTIFICATION (identification). SAY YOUR AIRCRAFT IDENTIFICATION AND THE (name) VOR COURSE SELECTOR READING.

5. Advise the pilot to continue the inbound heading.

PHRASEOLOGY-

CONTINUE HEADING (degrees).

6. Plot the new line of position from the second VOR, advise the pilot of the aircraft's position, and the safe altitude for orientation in that area.

PHRASEOLOGY-

YOU ARE (miles) (direction) OF THE (name) V-O-R. THE SAFE ALTITUDE FOR ORIENTATIONS IN THAT AREA IS (feet).

NOTE-

The intersection of the two lines of position is the aircraft's position at the time of the second VOR reading.

7. Request the pilot's intentions.

PHRASEOLOGY-

WHAT ARE YOUR INTENTIONS?

5-4-4. GUIDANCE TO AIRPORT

After establishing the aircraft's position and if the pilot requests guidance to the airport:

- a. Plot the course to the airport.

- b. Provide the course guidance information to the pilot.

1. Advise the pilot of the direction of the turn and the heading to the airport.

PHRASEOLOGY-

FOR A HEADING TO THE (name) AIRPORT, TURN LEFT/RIGHT HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

2. After the pilot reports established on the heading to the airport, advise the pilot of the position in relation to the airport.

PHRASEOLOGY-

YOU ARE (miles) (direction) OF THE (name) AIRPORT. CONTINUE HEADING (degrees).

3. Continue to provide assistance in the form of pilotage and airport information as necessary.

PHRASEOLOGY-

DO YOU SEE ANY PROMINENT LANDMARKS?

ARE YOU FAMILIAR WITH THE (name) AIRPORT?

(Name) AIRPORT FIELD ELEVATION (feet). IT HAS (number and surface type) RUNWAYS. THE RUNWAY/S RUN (direction). THE AIRPORT IS LOCATED (direction/distance) FROM (landmark visible to the aircraft).

4. Advise the pilot to report the landing airport in sight.

PHRASEOLOGY-

REPORT AIRPORT IN SIGHT.

5. Determine when the pilot no longer needs assistance.

PHRASEOLOGY-

DO YOU REQUIRE FURTHER ASSISTANCE?

6. When the pilot indicates assistance is no longer required, terminate the service. Provide the CTAF frequency, if appropriate, and the local altimeter setting.

PHRASEOLOGY-

(VOR/ADF) ORIENTATION SERVICE TERMINATED. COMMON TRAFFIC ADVISORY FREQUENCY (frequency). ALTIMETER (setting).

NOTE-

CTAF is defined as a UNICOM, Multicom, AFSS/FSS, or ATCT frequency.

7. Notify appropriate control facility of the aircraft's position, termination of services, and the pilot's intentions.